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Euthanasia of Equines (The Action of Magnesium)

By

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and

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Historical.—In the *Lancet* of 1883 it is recorded that Professor Matthew Hay injected epsom salts into the circulation of cats and other animals, giving 5 grains per lb. body weight. This produced powerful toxic effects paralysing first the respiration and afterwards the heart, abolishing sensation or paralysing the sensorimotor reflex centres.

A. J. Clark, in his "Applied Pharmacology," 3rd edition, page 148, writes: "A soluble salt of magnesium when injected into a rabbit produces a complete loss of excitability."

In the very valuable brochure report of the Special Committee appointed by the N.V.M.A. of Great Britain and Ireland on the subject of "Small-animal Euthanasia," page 13, it is stated: "It is not generally recognised that magnesium sulphate when introduced directly into the blood stream is a powerful and rapidly acting narcotic poison."

. . . . . .

Magnesium has been used in this hospital for some years for euthanasia, not only of small animals, but also of equines, and over 100 horses, mules and donkeys have had a painless end through the agency of this method.

The aim has been to accomplish the death of the animal without causing any reflex defensive movements, and with care this can be brought about.

Technique for Equines.—Instruments required for the operation are: a reservoir jar capable of holding at least 500 c.c. (an enema douche can serves this purpose well); two rubber tubes, one of about 1 cm. diameter and 150 cm. long and the other of ¼ cm. diameter and 100 cm. long; an adapter, clips to control the flow of solution, intravenous needles, pan for boiling solution and a bowl to contain warm water.

N.B.—This bowl is used especially in winter to keep the temperature of the solution regular and prevents recrystallisation of the magnesium sulphate.

Preparation of Magnesium Sulphate Solution.—An 80 per cent. solution of mag. sulph. is used, and this is prepared by dissolving the salt in boiling water. Filter and keep at body temperature.

Dosage for Equines.—0·5 c.c. of solution per lb. body weight in animals up to 800 lb.

N.B.—An easy method of estimating the body weight (B.W.) is by the formula:—

$$\frac{G^2 \times L}{300} = \text{B.W. in lb.}$$

G = The measurement of the girth in inches.

L = The length in inches from the point of the shoulder to the buttock over the ribs and under the hip.

Preparation of the Animal.—An area over *both* jugulars is clipped. The operation can be carried out in either the standing or recumbent position. A bed must be provided in both cases, for from the standing position the animal will faint and fall in a few seconds from the commencement of the flow of solution into the vein. Therefore, if the standing operation is chosen, the operator must be on his guard and care taken that the needle does not leave the vein or become displaced. It is better in the case of vigorous animals to put the animal down and secure it as for other operations.

Technique of the Operation.—When the solution has cooled to body temperature it is put into the container. The solution passes along the larger rubber tube by gravity then on to the smaller one and so to the adapter. Insert the needle into the jugular vein, wait until the blood flows freely, then connect the adapter to the needle, keeping the solution passing slowly and gradually into the vein. As before mentioned, crystallisation of the solution may take place in cold weather and this will block the tube. To prevent this, use the bowl containing warm water to keep the temperature regular.

OBSERVATIONS ON PROCEDURE AND RESULTS

(1) It is found that the optimum time to be occupied during injection is 2 minutes and 30 seconds. The time of death depends upon the age and condition of the animal.

It can be said that size and condition are large factors. Small and/or weak animals die quickly. It is important to see that the container is not held too high, or the solution will pour into the blood stream at a disturbing rate, causing convulsive and defensive movements.

Other points are:—

(*a*) Turbidity of the liquid.

(*b*) A too high temperature of the liquid increases convulsive movements.

(2) The time elapsing between the commencement of injection and loss of consciousness in 18 cases noted was from 30 to 90 seconds.

(3) When the solution is administered with the animal standing, it will faint in a very few seconds and fall to the ground, and be quite incapable of getting up by itself. If an attempt be made to lift it, it will give no assistance, showing commencing loss of consciousness. Some animals are perfectly quiet on the ground; others may move their legs. In the early days when the dosage had not been closely worked out donkeys which had so fainted lay for about two hours and completely recovered if no further solution was administered.

(4) When the agent is administered in the recumbent position, some animals, and these are usually small or very weak, die without having moved throughout the operation; others move their legs strongly, but rarely attempt to get up.

(5) As the intake of solution continues the breathing becomes gradually depressed. In a few cases it becomes quicker and irregular.

(6) Stoppage of the heart's action *always* occurs previous to failure of respiration.

7. *Abolition of Corneal Reflex* in ten recorded cases took from 40 to 90 seconds with an average of 68·5 seconds. The subject of lowest figures was suffering from acute tetanus.

After a very extensive use of this method of euthanasia we are very satisfied that it is a merciful and painless procedure.

We were fortunate to have had it at our disposal with the technique well known and developed during the present period, as ammunition for the humane cattle killer was quite impossible to obtain. What we had in stock had to be carefully conserved to accompany our ambulance on its errands into the countryside.

We send this note in the hope that it may prove of service, and the author first named takes this opportunity of thanking his veterinary assistants whose careful work has made it possible.

Haematuria in Cattle*

A. SUTHERLAND, M.R.C.V.S.,

BANGOR

Haematuria in the bovine animal is commonly encountered in my district. Diagnosis of the exact cause is often difficult and treatment is somewhat of a nightmare. The condition differs from haemoglobinuria (piroplasmosis) in that there is usually a distinct reddish discoloration of the urine and actual blood clots may also be present. If difficulty is experienced in differential diagnosis, a urine sample may be collected and submitted for microscopical examination when red blood corpuscles are found, or the sample may be "spun" in the centrifuge when the blood and urine will be found to separate into two layers.

The condition is seen in various pathological and bacteriological conditions affecting the uro-genital tract.

It may be found in the following conditions:—

(1) *Acute Nephritis.*—Haematuria is rarely seen in this condition except when caused by chemical irritants. In one case I encountered it was believed to be due to overdosing with turpentine. In this instance I was called in to a Shorthorn cow in milk which was passing blood at intervals. Two days previous to my visit, this cow had been blown, and had been given a bottle of turpentine mixed with water. On further enquiry I discovered that the bottle had contained about 1½ pints of turpentine. Symptoms noted were: arching of

* Presented to the North Wales Division, N.V.M.A., at Rhyl, March 26th, 1943.

the back, temperature 105° F., tenderness in the loin region, and stiffness of the hind limbs. Stomatitis was also present; the animal was off her feed. Linseed oil was administered (2 pts.) and small quantities were given daily in conjunction with gruel. About 8 gallons of water were given per stomach-tube two days later. Complete recovery occurred in about seven days.

Haematuria has been noted in calves housed and fed on hay, straw, crushed oats, with swedes and tops. The causal agent was considered to be the "swede tops." These animals were found to be passing blood-stained urine at very frequent intervals, were off their food with tenderness in the loin region and the temperature raised 2 to 3°. Small doses of saline purgatives were given and the roots with tops withheld. Recovery took place in about five days.

(2) *Chronic or Suppurative Nephritis.*—Haematuria is encountered much more frequently in this condition, especially in pyelonephritis. The symptoms first noted are generally those of unthriftiness, though the appetite often remains good. Temperature is usually normal or sub-normal. Sometimes there is a staggering gait and there may be thirst and constipation. A frothy condition of the urine may have previously been noted. Chronic or suppurative nephritis may often be due to secondary infections, *e.g.*, from metritis or other affection of the uro-genital tract. In this condition, in one or two instances a fracture of the external angle of the haunch ("hipped") has been noted. Renal calculi have been noted *post-mortem* in a few cases of "blood in the urine."

In chronic or suppurative nephritis treatment is most difficult, the common urinary disinfectants, *e.g.*, buchu, copaiba, cubebs, etc., being of little avail. Formalin in 2 oz. doses diluted in half a gallon of water and given per stomach-tube daily or every other day appears somewhat effective. Prognosis in these cases is bad, as often grave complications arise.

Cystitis.—Haematuria is more commonly found in this condition than in any other. The urine is blood-stained and clots are frequently present. Temperature is generally raised and there is often constipation. Tumours are commonly found in the bladder wall (polypoid in type). The most effectual treatment is irrigation of the bladder with a weak solution of non-irritant antiseptic, *e.g.*, acriflavine 1 : 1,000, 1 to 2 pints by catheterisation. Formalin *per os* may also be used. In a few rare cases of haematuria cystic calculi have been discovered but this is generally on *post-mortem* examination. The symptoms noted are kicking at the belly, switching of the tail and straining.

Urethritis.—This is most frequently encountered as an infection secondary to one of the aforementioned conditions or to metritis. The symptoms are similar to those of cystitis. Urethral calculi have also been noted several times in the male and treatment is surgical.

I have observed a form of haematuria in in-calf cows, where the urine may be slightly blood-tinged and blood clots may be passed spasmodically. The blood and clots appear to arise from or around the os uteri. In several of these cases the following symptoms have been noted some two or three weeks before calving at full term. The animals have a most unthrifty appearance, are generally off their feed, with a sub-normal temperature and often have a somewhat stiff gait. They rapidly lose condition and a dark-coloured catarrhal exudate is passed, which becomes more frequent as the condition progresses. These animals generally produce a dead calf and the foetal membranes, which often have to be manually removed, are of abnormal character, containing much oedematous haemorrhagic fluid. The uterine cotyledons are necrotic and there is an abnormal amount of uterine fluid.

I should be very grateful if members would give comments and observations on this latter condition.

Some Affections of the Hip Joint of the Dog, with special reference to Differential Diagnosis

Discussion by the Central Veterinary Society*

Dr. J. McCunn, who opened the renewed discussion, said he was in general agreement with the authors and complimented them on their paper. He proceeded to discuss in some detail each of the various conditions mentioned.

Epiphyseal Fracture or Separation.—Practitioners should remember that a "strain" may be anything short of fracture, and it is safer to diagnose and treat a so-called strain as a fracture than vice versa. With careful treatment many cases recover; some do so without any treatment and the prognosis is not so poor as the authors suggest. A "Thomas" splint, reaching just below the hock, with extension produced by elastic or a spring, is the best method of controlling movement. In his experience the condition is most common in Cairns.

Fracture of the Femoral Neck.—This is usually due to external violence and such cases do well under extension, a weight being applied as soon as fibrous union has been effected. Complete immobilisation is contraindicated.

Luxation of the Hip Joint.—Dorsal luxation can best be detected clinically by the abduction test and by rotation of the femur so that the head comes against one's finger. Leg measurement is unreliable because one cannot be sure of obtaining exactly equal extension of the limb joints, nor can one be certain that the pelvis is square. In only one of many cases of luxation had Dr. McCunn failed to get recovery and *post-mortem* examination of this case showed rupture of the round ligament and protrusion of the head through the joint capsule.

Reduction should not be carried out with excessive force, and it is often useful to have an assistant pressing on the great trochanter. Local anaesthesia is useful as by this means one avoids the uncontrolled movements which so often occur when the animal is coming round from a general anaesthetic. After a "local" the dog can sometimes use the limb immediately following reduction.

The authors might have mentioned congenital luxation which is usually bilateral and for which little can be done. Such animals frequently form "false joints" and appear to suffer little inconvenience.

Ventral luxation is easily diagnosed because one can palpate the femoral head from inside the thigh and also on rectal examination it may be felt through the obturator foramen.

In conclusion, Dr. McCunn emphasised that in making a diagnosis radiographs should be taken whenever possible, and he also stressed the value of a reasonable knowledge of the anatomy of the part.

Major H. Kirk suggested that some of the cases described by the essayists as "slipped epiphysis" may actually be Perthe's disease, and quoted the description of the latter condition in children given by Romani and Mitchiner ("Science and Practice of Surgery"). He submitted that their description agreed in all essential points with the condition seen in some dogs. This view was supported by the opinion of Schnelle, a well-known canine practitioner in Boston, U.S.A., both in his papers and in personal communications. All save one of Schnelle's cases were in fox terriers, and indeed the term "fox-terrier disease" is already in use in the U.S.A. for this condition. Much more work remains to be done before the exact nature of the condition is understood.

Regarding luxation of the hip, Major Kirk quoted a letter from Schnelle which stated that further treatment was necessary in over 20 per cent. of recent luxations and in *all* old luxations. Such cases need some form of splint. This opinion, based on a very large number of cases, was in contrast to Dr. McCunn's statement that no after-treatment was necessary following reduction.

Dr. Hare considered that the condition of the bones which the essayists had exhibited was consistent with the view that the cause was physical injury which resulted in partial or complete displacement of the articular head. The subsequent changes were probably due to defective nutrition.

Mr. Ambrose asked how the "Thomas" splint was applied and weighted.

Mr. T. L. Wright stated that the paper would help practitioners considerably in diagnosis. He mentioned that a useful method for the diagnosis of luxation of the hip was to place one thumb on the head of the femur and the other on the tuber ischii and compare the distance and height on the two sides. If the owner was prepared to wait patiently he thought it unwise to attempt reduction, and many such cases recovered spontaneously and became sound after three months.

Mr. Dunlop Martin said he found extension of the limbs of great value in the diagnosis of dislocation of the hip. He mentioned a striking example of accommodation following luxation of the hip and fracture of the acetabulum; after a year it was difficult to detect which was the injured limb. He thanked the authors for their valuable paper.

Major Oxpring added his congratulations and asked Dr. McCunn how he applied a "Thomas" splint and how extension was obtained.

Replies by Messrs. Formston and Knight

The President having now called on the essayists, Mr. Formston said: His own view regarding nomenclature was that those who made valuable original contributions should be given due credit for them, but he agreed that their names should not necessarily be given to the conditions which they may have been the first to describe. As to whether the conuition starts, as he believed, as epiphyseal separation, he repeated that the process is only observed when it has been in existence for some time and it then shows some of the features of Perthe's disease in man. Further observations of clinicians and pathologists will show whether this view is correct.

Mr. Gordon Knight observed that, in contrast to Dr. McCunn, he paid considerable attention to the length of the leg in dislocation of the hip and suggested that the test should first be made before anaesthetising the animal. He regarded "von Perthe's disease" and "coxa plana" as synonymous terms. "Coxa vana" merely implied a decrease in the angle between the neck and the shaft and one seldom saw it in dogs except as a result of trauma. He did not regard it as a pathological condition *per se*.

Dr. McCunn's Reply

Dr. McCunn gave a detailed description of a modified "Thomas" splint suitable for the application of extension. It was made by taking a suitable length of No. 12 or 13 gauge wire and covering it with rubber tubing. A loop was made to go round the crest of the ilium and fit comfortably in the thigh, then the wire was taken down the inside of the leg as far as one wished and bent at right angles, a small notch being made in this transverse part to anchor a broad rubber band used to apply extension. Finally, the wire is brought to the outside of the limb and brought up to the loop to which it is anchored. If it was intended that the animal should use the leg, the wire was taken over the back and looped round the other thigh so as to keep the loop on the damaged leg in position. The splint could be anchored to the leg by elastoplast.

Dr. McCunn did not agree that one could rely on measurement of the length of the extended hind limbs in the dog as the slightest variation in the angles of the joints would considerably affect the length of the limb. Dorsal dislocation of the hip was best diagnosed by placing the thumbs on the great trochanters and abducting the legs: the prominence of the trochanter became more marked, whereas in the normal limb it disappeared. Ventral dislocation was uncommon but sometimes occurred during attempts at reduction. The head of the femur could easily be felt and often even seen.

His own view of von Perthe's disease was that it was an end result of separation of the epiphysis. Separation interfered with the blood supply and metabolism of the part and this in turn caused erosion, absorption and diminished density of the bone.

As he said earlier, the authors had done a very good piece of work.

* Renewed discussion (February 4th, 1943) on paper by Messrs. C. Formston and G. C. Knight presented to the Society at the meeting held June 4th, 1942. (See *The Veterinary Record*, November 14th, 1942, for paper and report of preliminary discussion.)

Weekly Wisdom

History maketh a young man to be old, without either wrinkles or grey hairs; privileging him with the experience of age without either the infirmities or inconveniences thereof. Yea, it not onely maketh things past present, but enableth one to make a rational conjecture of things to come."—Fuller's "Worthies."

CLINICAL COMMUNICATIONS

A Case of Trichomonas Disease of Cattle in Northumberland

ERNEST GRAY AND W. LYLE STEWART,
KING'S COLLEGE, NEWCASTLE-UPON-TYNE

In March, 1943, a portion of placenta from a cow aborted at three months was received at the Department for bacteriological examination. A number of cows in the herd concerned had aborted at from eight months up to within a few days of full time, but not usually early in pregnancy, and sterility was common. Some cows showed a white vaginal discharge after service. About twelve blood samples from the herd had been tested over a period of three years by the Department, for the presence of agglutinins against *Br. abortus*, but in every case with negative results.

The portion of placenta was inflamed, dark red in colour, tough and spongy. One surface bore four foetal cotyledons with depressed and black centres and inflamed hypertrophied edges.

Smears and cultures on agar, blood-agar and McConkey proved negative for pathogenic bacteria, one smear revealed a large oval body resembling a trichomonad. A hanging drop preparation made from the condensation water of the cultures from the afterbirth showed a number of large flat motile organisms, which were examined by H. D. Crofton, Parasitologist in the Department. They were 10 to 14 μ in length, oval in shape, and depressed from above and below. An undulating membrane was occasionally seen and behind one specimen the action of flagella was visible. Some specimens presented a dumb-bell shape produced by a central constriction. The organisms were undoubtedly protozoa, and in view of the other findings and case history, presumably *Trichomonas foetus*.

Some of the condensation water containing the organisms was sowed into media prepared by dusting powdered starch over the free surface of a slope of blood-agar and pipetting a few drops of Ringer's solution on to the starch. After five days' incubation at room temperature a hanging drop preparation of the inoculated fluid revealed the same organisms to be present, and also some flat circular bodies, resembling, except in their larger size, the blackhead parasite of turkeys, *Histomonas meleagris*—encystment forms?

A hanging drop preparation of fresh vaginal mucus, collected by pipette from near the os of another suspected case served three days previously, revealed numerous motile protozoa identical in morphology with those previously isolated. When sown into the above special media, they were again recovered, though diminished in size, and sluggish in action, after three days' incubation at room temperature.

It is of interest to note that the trichomonads were obtained from a cow in a herd in which late abortion and sterility have been common. These abortions were presumably not due to *Br. abortus* infection.

REFERENCE

Vet. Rec. **49.** 211-214.

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A Febrile Disease of Sheep

J. M. FLETCHER, M.R.C.V.S.,
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This is a disease that, for the most part, affects bought-in sheep, particularly bought-in rams. Shearling rams appear to be the most susceptible (ram lambs and older rams being less susceptible). Inclement weather acts as a predisposing factor. Some farms are more prone to the disease than others. This may be due to infection persisting in the sheep-pens which are for the most part difficult to disinfect. Rams bought locally or those reared on the farm can be in contact with affected rams and yet not contract the disease, so that infection does not appear to be the only factor influencing its occurrence. The incubation period varies from one to six weeks.

Symptoms.—Nasal discharge; increased respirations; cough in some cases; temperature 103° F. to 108° F.; feeble pulse, increased in rate; faeces inclined to be dry in the early stages, in some cases containing clots of blood, later followed by diarrhoea in a subacute case; loss of appetite; in acute cases the ram tends to lie down.

Milder cases show a watery nasal discharge, occasional cough, slight temperature, appetite fairly good.

A number of bought-in rams are often affected at the one time.

Course.—In acute cases death ensues in from 24 to 72 hours. The death rate can be as high as 90 per cent. Subacute or mild cases may last seven to ten days, ending either in recovery or death. Death is often quite sudden.

Post-mortem Examination.—Acute congestion of the small intestines, congestion of the liver in some cases with small petechiae on the surface, myocarditis and pericarditis; if the course of the disease is very acute there may be no macroscopical lesions in the lungs; in less acute cases there is congestion of the parts of lungs in contact with the heart, while in others there may be congestion of both lungs.

Judging from symptoms and *post-mortem* findings, the path of infection appears to be in the following order: small intestines, liver, heart and lungs.

The pluck of one case was submitted to Professor Emslie, Glasgow Veterinary College, for examination. The report shows that *S. enteritidis* and *B. coli* (haemolytic) were isolated. A vaccine made from these organisms was used last autumn and the results were encouraging, no case being reported from inoculated rams. The vaccine was used in three different lots where the disease had already started. Mild cases recovered and the other contacts remained normal.

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Roll Making for the Hoof Pack in Canker

Mr. Lindsay Auchterlonie, of Nottingham, writes: "Being engaged at present on the treatment of a case of canker in a mare's foot, it occurred to me that a simple method of making very hard rolls of tow might be useful to those who have not yet tried it. With the ordinary method one has to use cunning and unless an amateur can be trained to do the job properly sufficient hardness is not attained, especially in those "thermometer thicknesses" which are essential for a good foundation. By using short lengths of cord or thick string as a focus a good start can be made right away.

"A few parallel threads of tow are placed around the cord and the rolling is begun, gently at first on a rough board and, of course, away from the body. The tow at once becomes bound up with the cord. As is well known from experience it is essential to use the fingers stiffly spread so that the bones of the hand can be brought well into play. On completion, the loose tow can be cut away where the cord ends.

In this way quite regular hard rolls with truncated ends can be brought accurately into position. Thicker rolls are made by merely adding more tow in stages."

Our New President, R.C.V.S.

Our readers will welcome the following tribute to Mr. William Nairn, of Blairgowrie, on his election as President of the Royal College, which was received by us from an old friend and colleague of Mr. Nairn shortly after publication of the note appearing in our issue of June 19th.

A native of Midlothian, born and brought up on his father's farm, William Nairn had the best possible upbringing for a veterinary career, and the knowledge he thus gained of the practical management of livestock and the land—under the able tuition of his father—provided the background upon which he based his essentially sound conclusions, not only on matters veterinary but on a wide range of subjects. After a distinguished record as a student at the Royal (Dick) Veterinary College, from which he graduated in the year 1903, his progress through the subsequent forty years of his professional life has been marked by those preferments and honours which are evidences of ability, determination, conscientiousness, goodwill, good commonsense, and all those other attributes which make for the successful and outstanding man. There is no more fitting exemplar of the truth "that sense and worth o'er a' the airth may bear the gree and a' that" as so aptly expressed by his national poet.

Mr. Nairn is a Past-President of the N.V.M.A. and of the Scottish Metropolitan Division, President of the Scottish Branch, Member of the Research Board in Veterinary Science for Scotland, Member of the Board of Governors of the Royal (Dick) College, Member of the Agricultural Committee of Perth Education Authority and for some time a Governor of the East of Scotland College of Agriculture. His personality though quiet and modest radiates with enthusiasm and energy when required, reflecting the activities of a fertile brain and a real and subtle sense of humour.

A man of sound judgment, a deep knowledge of Scottish life and character, and with a passionate desire to promote the welfare and maintain the dignity of his calling, he is held in the highest esteem both inside and outside his profession.

In the year which now lies before him his vision, understanding and tolerance will be well tested, but we are confident that the Council, having elected William Nairn to his high office, will be guided in its affairs with dignity and honour, with credit to the President himself and to the profession to which he has devoted his life.

ABSTRACTS

[I.—YEAST PROTEIN SUPPLEMENT FOR PIGS AND RELATION TO RICKETS. Braude, Kon, S. K., and White, E. G. (1943.) *J. comp. Path.* **3**. 161-189; **II.—SUCCESSFUL FATTENING OF PIGS ON DIETS WITH 20 PER CENT. YEAST.** Worden, A. N. (1943). *J. comp. Path.* **53**. 190-195.]

I.—Dried yeast was found to be able to replace successfully the protein supplement in the rations of fattening pigs, and no significant differences in nutritive values were found between ordinary brewers' yeast, debittered brewers' yeast and fodder yeast. However, when dried yeast was fed at the level of 8 per cent. of the diet containing 1·5 per cent. limestone, some of the pigs developed abnormal symptoms. The first was failure to clear up the ration completely and this was followed by stiffness and lameness of the hind limbs. The pigs walked on their toes with knees bent and knuckling under, and with straddling gait. In some cases there was suppression of urination and defaecation but these functions became normal when the pigs were lifted on their feet. The diagnosis of rickets was confirmed by extensive macroscopic, radiographic and histological examinations.

When the limestone in the diet (at the 8 per cent. yeast level) was replaced by 1·5 per cent. $CaCO_3$ no symptoms developed. Rickets were induced in another group fed at 20 per cent. level of yeast and 2 per cent. limestone early in the experimental period, but at the same yeast level and with 1·8 per cent. and 2·5 per cent. levels of $CaCO_3$ symptoms became evident only later in the experimental period. The rachitic condition was prevented in 20 per cent. yeast diets by the incorporation in the ration of 1 per cent. cod-liver oil falling later to 0·3 per cent. of the ration, and at an 8 per cent. level of yeast feeding no symptoms were produced when the Ca and P contents of the diet were increased to that of the 20 per cent. yeast level by the addition of suitable minerals.

Biochemical analyses of the blood showed that the symptoms were accompanied by a fall in serum calcium level; the ash content of the bones also fell. Full details of the pathology and of the radiographic findings are reported in the text.

II.—Wessex saddleback pigs were successfully fattened on a diet containing 20 per cent. dried brewers' yeast to which was also added 1·5 per cent. cod-liver oil daily. The relatively high P content of the diet was balanced by the addition of 2·5 per cent. ground chalk. No adverse effects were noticed throughout the fattening period and there were no signs of any rachitic conditions amongst the pigs. Carcase quality was satisfactory and there was no trace of taint in the meat.

A. E.

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[I.—RELATION OF SKIN LESIONS IN THE RAT TO DEFICIENCY DIET OF DIFFERENT B_2-VITAMINS. Chick, H., Macrae, T. F., and Worden, A. N. (1940.) *Biochem. J.* **34**. 580-94. **II.—OCCURRENCE OF FITS OF AN EPILEPTIFORM NATURE IN RATS MAINTAINED FOR LONG PERIODS ON A DIET DEPRIVED OF VITAMIN B_6.** Chick, H., El Sadr, M. M., and Worden, A. N. (1940.) *Biochem. J.* **34**. 595-600.]

I.—Two types of skin lesions were observed in young rats fed on basal, synthetic diets supplemented by vitamins A, D, B_1 and E but lacking one or more of the constituents of the B_2 complex. Type 1, called "rat pellagra," "rat acrodynia" or, in this paper, "dermatitis," is characterised by swelling and redness of the digits and ears spreading over limbs and trunk. It is mainly associated with vitamin B_6 deficiency. In type 2 there is loss of fur over head and chest without swelling and inflammation. The eyelids and nostrils become inflamed and the former may be stuck together with a serous reddish fluid which also exudes from the nostrils and is excreted in the urine, staining the fur. This type is mainly associated with absence of "filtrate factor" though somewhat similar lesions occurred in rats deprived of riboflavin for a long period.

Riboflavin deficiency in the rat is characterised by an eczematous condition of the skin around the eyes and nose, with the eyelids stuck together with serous exudate. Fresh evidence was provided that nicotinic acid is not essential for the rat.

It is not yet possible to define exactly the results of deficiencies of the various factors in the B_2 complex and the authors' own results and those of others are discussed.

II.—In rats fed for prolonged periods on synthetic diets deficient in B_6, with sucrose or raw starch as source of carbohydrate in the diet, epileptiform fits were observed. Traces of B_6 appear to be present in cereal starch and cooking the starch was found to give a lessened incidence of "dermatitis" and of fits, possibly by rendering this vitamin more available to the rat. In a previous work Chick *et al.* observed fits in young pigs fed on synthetic diets and it is considered probable that in these animals also the fits were associated with vitamin B_6 deficiency.

A. B.

QUESTIONS IN PARLIAMENT

Dairy Cattle (Diseases) (Scotland)

Mr. Lindsay asked the Secretary of State for Scotland what steps he is contemplating to institute further research into the causes and prevention of mastitis in dairy cattle, in view of the strong representations made by the Ayrshire Cattle Herd Book Society?

Mr. Johnston: I have carefully considered the representations referred to by my hon. Friend. As was explained in reply to the hon. Members for Renfrew (Major Lloyd) and Springburn (Mrs. Hardie) on April 6th, research into cattle diseases is being carried on at various centres in Scotland and elsewhere under the general guidance of the Agricultural Research Council, working in Scotland in association with the Scottish Board of Research in Veterinary Science. The work is being most actively pursued, and as close co-ordination of research is essential the establishment of a separate Scots organisation would not appear to be an improvement on the existing arrangements. Special Scots points will not be overlooked, inasmuch as Scotland is represented on the Agricultural Research Council; while the Scottish Board of Research in Veterinary Science, as mentioned in the reply of April 6th, includes eight science professors in Scots universities and six leading members of the veterinary profession in Scotland.

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Artificial Insemination

Mr. Price asked the Minister of Agriculture whether he will increase the number of stations where cattle-breeders can get facilities for the artificial insemination of their stock from approved sires beyond the two at present existing?

Mr. Hudson: No, Sir. Not until the results from the existing experimental centres are available.

Mr. Price: Are the existing stations being well used?

Mr. Hudson: They are experimental.

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Hill Sheep Committee (Scotland)

Mr. Snadden asked the Secretary of State for Scotland whether he is now able to state when the Committee on Hill Sheep Farming in Scotland will be in a position to present its Report; and whether an interim Report may be expected shortly?

Mr. Johnston: I am informed that the Hill Sheep Committee have made substantial progress and hope shortly to be in a position to frame their recommendations. I do not expect to receive an interim Report.

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Tuberculosis Statistics (Scotland)

Mr. J. Griffiths asked the Secretary of State for Scotland the number of cases of tuberculosis notified during 1942, with comparable figures for 1938 and 1941; and will he indicate whether any particular age-group shows an increase?

Mr. Johnston: The numbers of cases of tuberculosis notified during 1938, 1941 and 1942 were:—

	Pulmonary	*Non-Pulmonary*	*Total.*
1938 ...	4,793	2,772	7,565
1941 ...	5,739	2,555	8,294
1942 ...	6,207	2,824	9,031

Comparing 1938 and 1942, all age groups show increases in varying degrees, the most marked increase being in the 15–25 age group. I am sending the hon. Member a statement giving the figures in detail.

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Pests, Control (Humane Methods)

Sir E. Graham-Little asked the Minister of Agriculture what steps he has taken to ensure that in the control of mammalian pests the most humane methods are employed?

Mr. Hudson: Information and advice on controlling mammalian pests are circulated periodically to county war agricultural executive committees. In view of the enormous loss of foodstuffs caused by these pests, the overriding consideration must be to secure effective control, but subject to that consideration the methods advised are as humane as practicable and all possible steps are taken to avoid unnecessary suffering.

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Laboratory Overalls

Mr. Edmund Harvey asked the President of the Board of Trade why coupons for laboratory overalls are available for laboratory assistants in universities and technical colleges but not for the professors, lecturers and demonstrators who have to work in these laboratories; and whether he will make provision for coupons to be supplied in such cases?

Mr. Dalton: In view of the stringency of clothing supplies, I have had to limit the general occupational supplement to persons

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

July 14th.—Annual Summer Meeting of the Lancashire Division, N.V.M.A., at Liverpool; programme (see notice) commencing with luncheon at 12.45 p.m.

July 17th.—Meeting of the Society of Women Veterinary Surgeons, Royal Station Hotel, York, 2.30 p.m.

July 21st.—Meeting of the Western Counties Division, N.V.M.A., at Exeter, 2 p.m.

July 23rd.—Meeting of the Mid-West Division, N.V.M.A., at Bristol, 2.30 p.m.

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PERSONAL

Births.—Harbour.—On June 26th, 1943, to Mary (*née* McManus), wife of Harold E. Harbour, B.A., M.R.C.V.S., 32, Newbattle Terrace, Edinburgh, 10, a son.

Hignett.—On June 25th, 1943, at the Frascati Nursing Home, Bromley, Kent, to Muriel (*née* Ashdown), wife of Samuel Leslie Hignett, B.Sc., M.R.C.V.S., a son.

Pasfield.—On June 17th, 1943, to Mary (*née* Patten), wife of John Pasfield, M.R.C.V.S., Courtlands Farm, Coolham, a son, Peter Giles.

Ticehurst.—On May 23rd, 1943, to Dinah (*née* Porter), wife of Robert E. Ticehurst, B.Sc., M.R.C.V.S., of 67, Grenfell Road, Maidenhead, a son.

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Marriages.—Ewart–McLeod.—At Burnside Church on June 21st, 1943, Robert Heatley, M.R.C.V.S., elder son of Mr. and Mrs. J. C. Ewart, 23, Craiglockhart Loan, Edinburgh, to Helen, youngest daughter of the late Donald McLeod and of Mrs. Mary McLeod, 68, Springfield Park Road, Burnside, Glasgow.

Rabagliati—Pringle.—At the Cairo Cathedral on June 9th, 1943, by the Rev. A. J. Wilcox, Deputy Chaplain General, Colonel C. I. E. Rabagliati, R.E.M.E., elder son of Major and Mrs. D. S. Rabagliati, St. Margaret's Road, Edinburgh, to Joan, only daughter of the late Mr. C. Pringle and Mrs. Pringle, of St. Lambert, Montreal.

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Announcement of the promotion to Lt.-Colonel of Major K. C. Gresham, R.E., M.E.F., who is the son of Major F. B. Gresham, M.C., T.D., M.R.C.V.S., of Newark, Notts, and Mrs. Gresham, will interest many readers, more particularly those in Notts, Leicester, Loughborough, Palestine and South Africa.

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R.C.V.S. OBITUARY

Milligan, Alfred James, 5, Ednam Street, Annan, Dumfriesshire. Graduated Glasgow, December 23rd, 1890. Died June 29th, 1943; aged 74 years.

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GOVERNMENT STATEMENT ON SAFE MILK

The Government's statement on the subject of safe milk which, at the time of going to Press, it was anticipated would be made during the past week's series of Parliamentary sittings, and the White Paper issued in connection therewith, will be dealt with in an early issue.

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THE VETERINARY EDUCATION TRUST

Realising the need for more veterinary surgeons and having considered the Duke of Norfolk's appeal, Dorset F.U. have decided to give a donation of £100 to the recently formed Veterinary Education Trust, while the Norfolk F.U. are to launch a local fund in support of the Trust.

whose work is mainly manual and imposes heavy wear and tear on their clothing. For this reason, I have given the supplement to laboratory assistants and not to teaching staff, who generally spend many of their working hours in the lecture room. I regret that it is not possible for me to re-open the question of the occupational supplements for the present rationing period, but I shall be glad to consider any particulars which my hon. Friend may care to send me, in connection with the arrangements for the next rationing period which begins on September 1st next.

CONTROL OF DISEASES OF DAIRY CATTLE

Statement showing the Number of Undertakings notified to the Ministry of Agriculture during the Month of June, 1943

County	Undertakings Notified		Total Undertakings		
	During Month	Previously	Number	Number of Cattle	
				Cows	Heifers
England and Wales					
Bedford	1	38	39	849	513
Berks	5	80	85	3,070	1,982
Bucks	3	69	72	1,903	1,332
Cambridge	—	16	16	361	147
Chester	4	364	368	12,220	4,256
Cornwall	—	8	8	154	103
Cumberland	—	53	53	1,132	1,189
Derby	5	263	268	7,916	4,491
Devon	16	156	172	2,782	1,622
Dorset	2	64	66	2,054	1,042
Durham	3	233	236	5,447	1,875
Essex	9	222	231	8,273	4,753
Gloucester	4	83	87	2,653	1,457
Hampshire	7	333	340	9,899	6,017
Hereford	1	30	31	514	217
Hertford	1	66	67	2,150	1,245
Hunts	—	14	14	529	366
Isle of Ely	—	2	2	26	54
Isle of Wight	1	16	17	318	151
Kent	4	126	130	2,918	1,626
Lancs	7	194	201	5,636	1,642
Leics	1	82	83	2,194	1,481
Lincs (Holland)	—	4	4	45	11
Lincs (Kesteven)	—	20	20	263	142
Lincs (Lindsey)	1	71	72	1,450	757
Middlesex	1	11	12	510	226
Norfolk	2	174	176	5,232	3,295
Northants	3	66	69	1,893	1,314
Northumberland	1	50	51	1,664	823
Notts	1	115	116	2,701	1,485
Oxford	1	35	36	999	906
Rutland	—	9	9	157	109
Salop	6	232	238	7,354	3,554
Soke of Peterborough	—	2	2	71	56
Somerset	10	164	174	4,842	2,132
Staffs	1	191	192	5,598	2,911
Suffolk, E.	4	81	85	2,026	1,496
Suffolk, W.	2	42	44	959	580
Surrey	1	107	108	3,019	1,350
Sussex, E.	3	173	176	4,617	2,569
Sussex, W.	1	110	111	3,129	1,772
Warwick	4	116	120	3,055	1,823
Westmorland	—	18	18	499	568
Wilts	6	70	76	3,319	1,520
Worcester	6	135	141	3,037	1,489
Yorks, E.R.	4	80	84	1,342	712
Yorks, N.R.	—	103	103	2,101	1,241
Yorks, W.R.	2	246	248	6,194	2,315
Wales					
Anglesey	—	36	36	678	424
Brecon	—	3	3	50	22
Caernarvon	—	106	106	1,775	891
Cardigan	—	21	21	300	238
Carmarthen	4	193	197	3,515	1,863
Denbigh	2	57	59	1,184	592
Flint	3	100	103	2,276	990
Glamorgan	2	78	80	1,284	464
Merioneth	—	11	11	138	82
Monmouth	4	41	45	1,037	612
Montgomery	1	13	14	257	187
Pembroke	2	87	89	1,651	1,040
Radnor	—	—	—	—	—
Totals	152	5,683	5,835	153,421	80,182

Notes.—Of the total 5,835 undertakings notified to date, 1,541 are for 1 year, 394 are for 2 years, and 3,900 are for 3 years. 20 undertakings for 1 year have been in operation for the full period, of which 2 have lapsed and are excluded from the table above, 12 have been renewed for 1 year, 3 for 2 years, and 3 for 3 years.

Scotland					
Aberdeen	1	24	25	1,121	333
Angus	—	17	17	659	232
Argyll	—	5	5	90	83
Ayr	1	49	50	1,854	1,534
Banff	—	2	2	103	20
Berwick	—	1	1	33	22
Bute	—	—	—	—	—
Caithness	—	—	—	—	—
Clackmannan	—	5	5	183	150
Dumfries	—	17	17	911	727
Dumbarton	—	3	3	105	86
East Lothian	—	7	7	191	100
Fife	2	27	29	1,035	535
Inverness	—	9	9	291	186
Kincardine	—	4	4	215	111
Kinross	—	4	4	77	34
Kirkcudbright	—	16	16	951	728
Lanark	—	21	21	760	558
Midlothian	—	1	1	44	69
Moray	—	—	—	—	—
Nairn	—	1	1	14	—
Orkney	—	—	—	—	—
Peebles	—	5	5	93	55
Perth	—	30	30	679	405
Renfrew	—	9	9	384	297
Ross-shire	—	4	4	128	72
Roxburgh	—	—	—	—	—
Selkirk	—	—	—	—	—
Stirling	—	27	27	819	591
Sutherland	—	3	3	77	61
West Lothian	—	2	2	99	70
Wigtown	—	31	31	2,140	1,167
Zetland	—	—	—	—	—
Totals	4	324	328	13,056	8,226

Duration of Undertakings: 1 year, 81; 2 years, 31; 3 years, 216.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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VETERINARY EDUCATION AND RESEARCH

Sir,—It is now many moons since Professor Dalling presented his epoch-making address pointing out that the future of the veterinary profession was in prevention rather than cure, and since then the Survey Committee after protracted travail has bought forth its scheme which to some of us appears incommensurate with the important part which the profession can play in the resuscitation of the decadent pastoral industries of this country and by no means comparable to an efficient and beneficent State Veterinary Service such as we from overseas had visualised.

It is, therefore, with considerable interest that I now read in a sub-editorial of *The Times* of June 7th last, entitled "Safer Milk," the following all-important admission: "Every dairy herd in this country should be inspected by a qualified veterinary man at least once a year. If the staff were available, a quarterly inspection should be the minimum requirement. Unsatisfactory cows must be eliminated before they have time to spread trouble."

From the above it would appear that an enlightened and influential section of the Press is now convinced of the value of the "veterinary man"—a term which, we may hope, is intended to distinguish the fully qualified member of the Royal College of Veterinary Surgeons from those of the army of quacks with which we are now threatened. And now that the Press has set such a good example the Government itself and the agricultural community may be persuaded to adopt a more appreciative attitude towards us.

It is unfortunate that the pontifical utterances of the learned experts of the Survey Committee and the criticisms which they evoked from the rank and file of the profession throughout the country, have somewhat shaken the faith of the public in our ability to control the four major diseases of cattle. But there are many other directions in which we—and we alone—can play a valuable part, if not in the present war effort, in the post-war reconstruction of the pastoral industries which will be necessary if the agricultural industries of Great Britain are to "hold their own" against the inevitable competition with which they will be assailed. As every veterinarian knows, our flocks and herds are at present riddled and ravaged by diseases which must be eliminated before the pastoral industry can be restored and rebuilt upon a sound foundation, that is, a foundation of good health.

We are apt to forget our own virtues and to labour under an inferiority complex. This is quite unjustified. Seeing that in the past we have almost entirely provided our own education, the results are stupendous and our scientific progress compares more than favourably with that of, let us say, the medical profession, which, incidentally, has not yet found a prevention or cure for tuberculosis, undulant fever, many forms of sterility, or even cancer, common cold, mumps, measles and a hundred-and-one minor ailments which for centuries have afflicted the human race. And yet its valuable services are not despised and rejected.

If we have been denied our proper place in the present war effort we should at once commence to prepare ourselves for the peace. And since a large army of properly qualified and practical veterinary surgeons will be urgently required in the immediate future for a State Veterinary Service, veterinary education and the research upon which it must be based should be accepted as an obligation upon Government. It should no longer be relegated to our small profession or to the charity of well-intentioned sections of the community. The agricultural industry is the premier industry of this country and it is the bounden duty of the State to supply all that is necessary for its welfare and development.

Yours faithfully,

Alton, L. E. W. Bevan.
Hants.
June 8th, 1943.

VETERINARY EDUCATION

Sir,—I think the profession suffers primarily through a lack of post-graduate courses, and I am quite satisfied the matter cannot be properly rectified if the basic course is maintained at five years. Apart from the economic aspect, the time factor renders it impracticable to attend college for five years and then embark on one or two years post-graduate study. We must surely aim at producing both general practitioners and specialists, but, if our present title is to be maintained, all graduates must be basically veterinary surgeons and then supplement this basic training for any special work they desire to undertake. I can see no reason why the basic training should not be effected in a maximum of four years. This would entail a compression of the existing curriculum but should not be unduly difficult. While chemistry and physics could easily be taken at school—a veterinary atmosphere is obviously unnecessary for them—biology should be maintained as a college subject and given more prominence. To compress the rest of the curriculum good approved text-books—or printed lecture notes—are absolutely essential. I remember vividly the hours spent at college taking notes and thinking, even then, of the waste of time for everyone concerned.

I can never understand why so much stress is placed on the desirability of veterinary teachers carrying out research work. I consider a teacher who is really teaching can have very little time for real research work, and it is questionable, to my mind, whether a good teacher necessarily makes a good research worker and vice versa. Routine laboratory diagnosis, yes: and possibly one or more research men attached to each veterinary college for research purposes, but not for teaching as well, except, perhaps, an occasional discourse on their pet subject.

Let us hope book-keeping is never introduced to the curriculum. If a veterinary surgeon cannot acquire a book and read up this matter I feel very sorry for him, or her.

In the most interesting Liverpool experiment I see the possible too solid acceptance of ideal conditions, as the farm, hospital, etc., must surely tend that way, and the sobering effect of "seeing practice" must be quite as necessary as at present.

As a test of the method of selection by psycho-analysis why not have the members of the Education Sub-Committee psycho-analysed and the findings published as to their suitability for the undertaking? Students could continue to be selected, meantime, by examination with or without an interview and by refusing to admit all conscientious objectors.

Yours faithfully,

"Hadleigh," William A. Milligan.
Sleaford Road,
Boston, Lincs.
June 5th, 1943.

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THE GENERAL PANEL

Sir,—I am very perturbed with No. 5 recommendation to be considered by the Council N.V.M.A. *re* proposed new General Panel. If I read correctly, it insists that an assistant shall be in the employ of a given practitioner for a period of twelve months before he can be of any "panel" help. To my mind this is a terrible imposition on both parties. Surely the insistence on a definite period of post-graduate experience, not necessarily with the same practitioner, would fit the case?

Yours faithfully,

"Fairholme," William Sewell.
London Road,
Uckfield, Sussex.
June 28th, 1943.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
May 16th to 31st, 1943...	9	—	—	1	11
Corresponding period in—					
1942 ...	18	4	—	5	22
1941 ...	28	35	1	4	49
1940 ...	26	—	2	6	209
Total Jan. 1st to May 31, 1943	143	10	5	98	214
Corresponding period in—					
1942 ...	144	16	26	115	186
1941 ...	244	253	8	129	724
1940 ...	260	18	14	115	1,667

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.*, herds officially certified as free from Tuberculosis as at May 31st, 1943, was as follows:—

England	Wales	Scotland	Total (Great Britain)
3,897	8,753	3,428	16,078